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79. (amended) A method of roasting coffee beans in a roasting container having a viewing window comprising the steps of establishing the degree to which the coffee beans must be roasted to attain a desired aroma by preestablishing a first parameter which is a function of light reflected by the beans during roasting; roasting the beans at a roasting temperature; positioning a spectrometer at a location spaced from the window and the beans being roasted, the spectrometer comprising a laser emitting light and being adapted to analyze light sensed by the spectrometer; activating the laser to thereby direct laser light onto the beans being roasted; with the spectrometer sensing light from the laser reflected by the beans being roasted; comparing the sensed, reflected light with the first parameter; and terminating the roasting step when the sensed light reflected by the beans being [noted] roasted reaches the first parameter.

REMARKS:

Claims 1-11, 56-58 and 62-79 are pending.

Applicants acknowledge and thank the Examiner for the withdrawal of the final rejection of the claims.

The dependency of claim 64 has been corrected.

The application currently contains seven independent claims. Of these, five, namely claims 1, 11, 62, 70 and 71, were rejected for obviousness over Porzi alone (claim 70), over Porzi in combination with Tidland (claims 1 and 71), or over Porzi, Tidland and Valle (claims 11 and 62), while two, namely claims 56 and 79, were rejected for obviousness over Porzi in view of Grubbs (claim 79) or further in combination with Tidland (claim 56).

Turning first to the rejection of independent claims 1, 11, 62, 70 and 71, the primary basis for the rejection in each instance is that Porzi is viewed as teaching the roasting of coffee by employing a photo-detector for monitoring the beans, while Tidland is viewed as teaching roasting including the removal of pollutants from the exhaust, recycling filtered air, "mixing the filtered air with cool ambient air (col. 2, line 51), and *discharging the remainder of the filtered air to the surrounding room* (col. 2, line 40)" (italics added). From this it was concluded that it would be obvious "to incorporate the exhaust system of Tidland et al. into the

invention of Camerini Porzi since Tidland et al. teach that this makes the roasting system more energy efficient (col. 2, line 44) and hence decreases the cost of operating the roaster". (Page 3, section 5 of the Office Action.)

Applicants disagree.

As previously pointed out, a very important aspect of the present invention is that coffee roasting can take place in a closed environment, e.g. inside a retail store such as a supermarket, without polluting or overheating the indoor environment and, also, without requiring the conventional ventilation to the exterior. This is made possible by roasting the coffee beans with appropriately heated air in a roasting drum. The exhaust air from the roasting drum (which is laden with pollutants and has a high temperature) is substantially completely cleaned, cooled to about room temperature, and continuously discharged into the closed environment surrounding the coffee roaster, while coffee roasting is in progress.

The present invention provides additional benefits. It does not pollute the outside atmosphere with the heavily contaminated exhaust gases, and it avoids an undesirable moisture buildup inside the roasting machine even though the green (fresh) beans have up to 20% (by weight) moisture content which is driven off by the high roasting temperatures.

Each of independent claims 1, 11, 56 and 62 is specifically limited to cleaning and cooling the roasting exhaust gases and discharging them into the surrounding, closed environment while roasting is in progress. Thus:

- claim 1 is limited to "discharging a minor portion of the filtered air while reheating and recirculating the major portion of the air" over the fresh product;
- claim 11 recites "while flowing the heated air over the fresh beans [to roast them] discharging the cooled, pollutant-free, room temperature air into a substantially closed room frequented by humans"
- claim 56 recites "removing from the used air substantially all debris, smoke, oil, and other pollutants; after the step of removing, cooling at least a

portion of the used air; discharging the portion of used air into the enclosed room while continuing to heat the fresh beans;"

- claim 62 requires "roasting fresh product at a roasting temperature by flowing heated air over the fresh product; while flowing heated air over the fresh product removing substantially all pollutants from the air downstream of the fresh product being heated, cooling the air downstream of the fresh product to substantially room temperature, and thereafter, while continuing to flow heated air over the fresh product, exhausting the cooled air into a room of a building".

Claim 71, also rejected for obviousness over Porzi in view of Tidland, does not contain a limitation requiring discharging cleaned, reduced temperature exhaust gases into a closed environment while roasting is in progress. However, it is non-obvious over these references for other reasons, as is discussed below.

Independent claims 1, 11, 56, 62 and 71, and therewith the claims depending from them, were primarily rejected over Porzi and Tidland because Tidland was viewed as teaching a roasting method which, amongst others, mixes "the filtered air with cool ambient air (col. 2, line 51), and [discharges] the remainder of the filtered air to the surrounding room (col. 2, line 40)".

First, the references in the Office Action as to what Tidland discloses on lines 40 and 51 of column 2 are inaccurate.

Contrary to the Office Action, at column 2, line 51, Tidland does not disclose "mixing the filtered air with cool ambient air". That portion of Tidland discloses that "an ambient air damper is hinged close to the fan and selectively directs ambient air from outside a roasting system into the roasting chamber". There is no indication in this portion of Tidland when, how and under what circumstances the air dampener is opened.

Further, column 2, line 40 of Tidland does not disclose to discharge the remainder of the filtered air to the surrounding room, as was asserted in the Office Action. What Tidland discloses there is "continuously filtering the recirculated air allows the roasting

system to be placed in a room without requiring outside ventilation and without producing objectionable odors". This portion of Tidland does not state that any roasting air is discharged.

Further, the two citations to the Tidland patent are taken out of context. The Office Action suggests that Tidland discloses mixing the filtered exhaust air with cool ambient air and discharging some remainder to the surrounding room. The Tidland patent has no such disclosure. The quotes were taken out of context and reassembled in a manner not supported by anything stated in the Tidland patent so as to support an argument that Tidland discloses discharging cleaned roasting exhaust into the surrounding room.

For this reason alone, the obviousness rejection of this group of independent claims is without merit and should be withdrawn.

This out-of-context combination of misquoted portions of the Tidland patent also demonstrates an impermissible hindsight reconstruction of the prior art which ignores the teachings of the prior art and substitutes therefor what is disclosed in the present application. The disclosure of a patent is not measured by isolated phrases or sentences. A patent discloses what it teaches to one skilled in the art, no more and no less.

What Tidland discloses is an indoor coffee roasting machine which seeks to filter and clean the air used to heat the beans, however, the "reheated air is then recirculated back into the roasting chamber" (col. 2, lines 27-28.) This "[c]ontinuously filtering the recirculated air allows the roasting system to be placed in a room without requiring outside ventilation and without producing objectionable odors" (col. 2, lines 39-42). *However, during roasting no air is cooled and no cooled, cleaned air is discharged to the surrounding room.*

As is best illustrated in Fig. 4 of Tidland, hot, polluted exhaust air from the roasting drum flows into a cyclone (60) for the removal of particulates and from there via a pipe (61) along dashed line (5) past open dampers (20), through filters (72, 74, 76, 78), past heating elements (54), and via fan (30) and duct (32) (see Fig. 1) back to the roasting chamber (36).

Tidland notes that the heating elements (54) heat the air to a sufficient temperature to begin roasting the green coffee beans (col. 5, lines 30-31) and that "as the hot

air expands, some of the excess air in the roasting system 12 escapes through the filters 17 and 18 to the outside environment" (col. 5, lines 42-46). In the context of the disclosure in column 5, lines 19-53 and the drawings, particularly Fig. 4, it is clear that the expanding "excess air in the roasting system 12" (col. 5, line 44) refers to air in the system during the startup phase. During the actual roasting process, dampers (20) are open and contaminated, still-hot air (though not sufficiently hot for roasting) flows through filters (72-78) and past heater (54) back into the roasting chamber. If the air coming from the roasting chamber and cyclone (60) were permitted to exit past filters (17, 18), the exiting air would be both hot and relatively unfiltered, i.e. still heavily polluted. Filters (17) and (18) are only casually mentioned as being a coarse and an electronic filter, respectively, without further describing their characteristics or functionality. In contrast, the characteristics of and stringent requirements on filters (72-78), which are downstream of dampers (20) and the filters (17, 18), are discussed in some detail in column 4, lines 28-40, and they include, in addition to a coarse fiberglass filter similar to filter (17), a high efficiency electronic filter for removing micron-sized pollution particulates and a carbon filter to remove odors from the exhaust. These filters clean the exhaust air from the roasting chamber and remove odors so that roasting with the same, continuously recirculating air can continue.

If just a portion of the recirculating, used air were permitted to escape to the exterior of the roaster past filters (17, 18), the air would be hot (typically in the vicinity of several hundred degrees F) and full of pollutants. If such a machine were to operate in a closed room frequented by humans, the humans would suffocate in short order.

Thus, Tidland teaches exactly what it says, namely to recirculate the filtered and reheated air back into the roasting chamber (col. 2, lines 27-28), and no part of the air, except expanding air during startup, and some air after conclusion of the roasting, is permitted to escape.

The above-summarized disclosure of Tidland teaches to one of ordinary skill in the art to continuously roast coffee by circulating and cleaning the hot roasting air without discharging any portion thereof to the exterior, except excess air resulting from the expansion of the air as it is initially heated at the beginning of the process from its ambient temperature to

the roasting temperature of several hundred degrees F. If the person skilled in the art had any question in this regard, the disclosure in the last paragraph of column 2 of the Tidland patent makes it clear that no air is released to the surrounding room during roasting. It states:

> "*After* the coffee beans reach a predetermined temperature, the exhaust damper prevents the hot air from recirculating through the roasting system and forces the recirculated air out through the exhaust filter to the outside environment. The ambient air damper directs cooler outside air into the roasting chamber. A spray system sprays water up from the air infeed vent into the roasting chamber. The dampers in combination with the water spray quickly cool down the roasted coffee beans, preventing the coffee beans from over roasting." (italics added)

The quoted paragraph is clear; the exhaust dampers are opened after the coffee beans have been fully roasted, in the Tidland patent referred to as after they have reached a "predetermined temperature" (col. 2, line 58; col. 7, lines 22-23; col. 10, line 54 (claim 21); col. 12, lines 2-3 (claim 26)). The ambient air dampener referred to in the quoted paragraph in column 2 of the Tidland patent is described as follows (in col. 7, lines 27-34):

> "The damper 24 is opened and at the same time that a water spray 29 from nozzle 34 is activated, allowing the fan 41 to blow cooler ambient air into roasting chamber 36. The water spray 29 is activated for a preset time period, and then shut off. The combination of cool ambient air through damper 24 and the water spray 29 from nozzle 34 quickly cools down the roasted coffee beans 15. Thus, the beans do not continue to roast after reaching the selected temperature."

Thus, only *after* the beans have been fully roasted is fresh air permitted into the system. During roasting, the system is closed and the air is recirculated.

The quoted passages teach one of ordinary skill in the art that according to the Tidland patent, during roasting, air is continuously filtered, heated and recirculated until the

beans are fully roasted. When that point has been reached, and to prevent overbaking or roasting, the heater is shut off, the "hot recirculated air" is vented through exhaust section 16, and fan 41 blows cool ambient air into the roasting chamber. Cooling is enhanced with the additional water spray.

This is also precisely what Tidland claims. Independent method claims 21 and 26 are particularly revealing in that respect because both recite "drawing the heated air and smoke from the roasting chamber; filtering the smoke from the heated air used for roasting the coffee beans; reheating the filtered air; and *recirculating the reheated air back into the roasting chamber* until the coffee beans reach a preselected temperature".

Thus, the Tidland patent teaches to one of ordinary skill in the art, and indeed any layman, to roast coffee in an entirely closed system, permitting an initial venting of excess air as the system is heated from the ambient temperature to the roasting temperature (to accommodate the temperature-induced expansion of the air in the system), then cleaning, reheating and recirculating the air until the beans are fully roasted, and thereafter quickly discharging all air (including the pollutants entrained therein during the last pass of the air through the roasting chamber) to the surrounding room. Tidland would give no clue to one of ordinary skill in the art that a roasting system should be built and operated in which the roasting air is cleaned, cooled and discharged to the surrounding environment after a single pass of the hot air through the roasting chamber. Tidland also has no indication how such a coffee roaster is to be constructed.

In addition, Tidland specifically discloses that at the end of the roasting process the **hot recirculated air** (col. 7, line 25), and not pollution-free, room temperature air, is vented.

Independent claims 11, 56 and 62 (but not independent claim 1) were additionally rejected over the newly cited Valle patent. Valle was cited as disclosing to incorporate in the teachings of Porzi and Tidland "a method of roasting foods comprising mixing cool ambient air with filtered exhaust air before venting the mixture to the surrounding room (col. 2, lines 55-64)". From this, it was concluded that it would be obvious "to incorporate the cooling of Valle et al. into the invention of Camerini Porzi since Valle et al.

teach the advantages of venting exhaust air lacking smoke particles, moisture and high temperature to the surrounding room in order to improve the work environment for the roaster operator (col. 2, lines 55-64)" (paragraph bridging pages 4 and 5 of the Office Action).

First, applicants note that Valle is for a conventional broiling or roasting oven used in home kitchens. As such, the oven operates at much lower temperatures than a coffee roaster and is only sparingly used, as contrasted with a coffee roaster which must be able to operate on a continuous basis.

Second, none of the claims in the present application require mixing fresh air with the hot exhaust from the roaster.

Third, Valle briefly mentions to "minimize smoke particles" (col. 4, line 34) from the exhaust air by directing it through a catalyst to effect a chemical reaction. Valle nowhere suggests how the much more complex pollutants generated by coffee roasting (particulates, including chaff, as well as white plume smoke, oily smoke, volatiles, hydrocarbons and the like (page 22, lines 1-3 of the present application)) can be *completely removed* while lowering the temperature of the coffee roasting exhaust from about 500° F to about 100° F so that the exhaust can be discharged into a closed room. Valle contains no suggestion to completely cleanse and clean hot coffee roasting exhaust for the simple reason that its device can only "minimize" smoke particles under the much lesser temperature and operating times encountered with ovens for domestic kitchens.

Accordingly, Valle does not supply what is missing from Porzi and Tidland to render the present invention in general, and the above-discussed claims independent claims 1, 11, 56 and 62 in particular, obvious over Porzi, taken alone or in combination with Tidland and/or Valle.

The same observation applies to dependent claims 2-8, 57, 58, 63 and 64. Even though many of them are directed to independently allowable subject matter, they include the above-discussed limitations of their parent claims by virtue of their dependencies from them, which renders them allowable as well.

Independent claims 70 and 71 were rejected for obviousness over Porzi alone, and Porzi and in view of Tidland, respectively. These claims are directed to terminating the roasting step as a function of at least two separate and independent parameters. Thus:

- Claim 70 requires "adjusting the step of discontinuing the roasting of the fresh product as a function of at least one of the roasting temperature and atmospheric pressure".
- Claim 71 recites "generating at least one second parameter which reflects a predetermined development of the first parameter [color or degree of darkness] during a roasting of the product; ... and adjusting the roasting step when the second parameter indicates that a deviation from the predetermined development of the first parameter occurred to thereby reestablish the predetermined development of the second parameter".

Porzi was viewed as teaching a roasting method comprising a photo-emitter, a photo-detector, a colorimeter and "a comparator which ends the roasting when the signals from the colorimeter and the photo-detector are equal". However, claim 70 specifically requires storing and monitoring two parameters which affect the roast as well as adjusting the step of terminating the roasting "as a function of at least one of the roasting temperature and atmospheric pressure". Neither Porzi nor any other reference of record discloses to monitor two separate parameters for purposes of terminating roasting. Porzi, as well as the other references of record, also failed to disclose or suggest to terminate roasting as a function of the atmospheric pressure.

Accordingly, claim 70, and therewith claims 9 and 10 depending from it, are not obvious over Porzi, taken alone or in combination with any other prior art reference of record.

Independent claim 71 is directed to a roasting method in which a first roasting parameter is established and roasting is terminated when the product in question reaches that parameter. In addition, claim 71 requires "generating at least one second parameter which reflects a predetermined *development* of the first parameter during roasting of the product; ... monitoring the at least one second parameter during roasting; and adjusting the roasting step when the second parameter indicates that a deviation from the predetermined *development* of

the first parameter occurred to thereby reestablish the predetermined *development* of the first parameter". The importance of monitoring the *development* of the first parameter, e.g. the darkness or color of the coffee beans, is set forth in some detail on page 8, lines 4-18 of this application, as follows:

> "In addition, the progress of the roasting operation, and in particular the change in darkness or *development* of the beans during roasting, is monitored in real time and compared to the darkness change encountered during the sample roast. If, during a subsequent on-site production roast, the darkness (or color) *development* of the beans deviates from that recorded during the sample roast, other roasting parameters, such as the hot roasting air temperature and/or the roasting air flow rate, are adjusted until the change in darkness corresponds to that established by the sample roast. This assures that the coffee bean finish obtained during the sample roast and judged to be optimal for the bean is precisely replicated during each production roast on each of the individual roasting machines that form part of the overall system." (italics added)

Neither Porzi nor Tidland nor any of the other cited references anywhere suggest to monitor any parameter other than the one which terminates the roast, e.g. color or darkness. In the absence of any corresponding disclosure or suggestion in the prior art, claim 71 is not obvious over any of the references, taken singly or in combination.

Claims 72-78 depend and derive their patentability from claim 71. In addition, the dependent claims have individual limitations, many of which are discussed above, which make them independently allowable because the prior art neither discloses nor suggests the recited subject matter.

Accordingly, dependent claims 72-78 are also not obvious over the cited references.

Independent claim 79 was rejected for obviousness over Porzi in view of Grubbs. Claim 79 is limited to a coffee roasting method which employs a spectrometer that directs a laser beam onto the beans being roasted. The claim recites that the spectrometer is positioned "at a location spaced from the window [of the roasting chamber] and the beans being roasted ... the spectrometer sensing light from the laser reflected by the beans being roasted; comparing the sensed, reflected light with the first parameter; and terminating the roasting step when the sensed light reflected by the beans being roasted reaches the first parameter".

To provide an accurate readout, Porzi arranges multiple photo-emitters (1) about a centrally located fiber bundle end (19) and mounts them in a common, cooled housing which is fixed to a flange surrounding the inspection glass (4) of the coffee roaster. In use, beans being roasted contact the opposite side of the inspection glass. Light generated by the emitters is directed through the inspection glass onto the beans on the other side thereof. Some of the light from the emitters reflected by the beans is captured by the fiber bundle end and relayed to a photo-detector (2). The captured, reflected light is compared with a control setting from a colorimeter (7) of a processing unit (6). When the two match, the roasting oven is shut off (col. 4, lines 3-29).

Porzi is concerned with disturbances and measurement inaccuracies resulting from ambient light. This is eliminated by totally enclosing the photo-emitters in a water-cooled housing mounted onto the viewing window for the roasting chamber and placing the photo-detector in a remotely located processing unit (col. 4, lines 11-16). The complicated structure of Porzi's coffee roaster is apparent from its Fig. 1.

Contrary to Porzi, claim 79 requires "a spectrometer at a location spaced from the window and the beans being roasted, the spectrometer comprising a laser emitting light and being adapted to analyze light sensed by the spectrometer". By spacing the spectrometer (including the laser) from the window, the heat distortions which concerned Porzi and which required the provision of a separate, water-cooled housing to maintain a constant temperature are eliminated.

Grubbs was relied on in the Office Action as disclosing the use of a helium-neon gas laser for monitoring the evaluation of coffee bean colors. However, claim 79 is not limited to the evaluation of coffee bean colors with a laser and specifically recites the relative positioning of the spectrometer, including the laser, which avoids the problems which Porzi sought to solve with the water-cooled housing.

Grubbs contains no disclosure concerning the positioning of the laser, has no drawings, and in relevant parts discloses (from col. 6, line 65 to col. 7, line 57) to measure "the light reflected by a single flake particle impinged with light from a standardized source" (col. 7, lines 6-9). This is done by placing a "random sample flake, of a size which permits handling, ... on a movable platform or table within a light-tight enclosure". The table is adjustable for forward, backward and lateral movement (col. 7, lines 10-15). A helium-neon gas laser directs light through a hole in an enclosure surrounding the movable platform so that it impinges upon "the sample flake. ... the flake surface is scanned by manual adjustment of the platform to locate the point of highest reflectance as detected by the fiberoptic sensor." (col. 7, lines 47-52).

Grubbs provides no disclosure that would suggest to one of ordinary skill in the art to mount the photo-emitters and the associated fiber bundle end at a location spaced from the inspection glass to prevent signal drift due to heating. Grubbs' process is limited to the inspection of a single sample flake which must be mounted on a freely movable table for manually positioning the flake to generate maximum reflectance. These flakes are neither in a heated environment, nor do they move or tumble, as is the case during the roasting of coffee beans. There is therefore no suggestion whatsoever in Grubbs how to modify the photo-emitter/fiberoptic ends to eliminate the need for the water-cooled housing of Porzi.

Claim 79, however, specifically recites "positioning a spectrometer [which includes the laser] at a location spaced from the window and the beans being roasted". The only relevant disclosure in this regard is found in the present application.

Thus, claim 79 is not obvious over Porzi in combination with Grubbs.

The non-obviousness of claim 56 over Porzi, Tidland and Valle was discussed above. Claim 56 was additionally rejected over Grubbs because claim 56 also requires a laser

of a specified frequency. Regardless how Grubbs is viewed, it does not supply what is missing from the other references applied against claim 56. Thus, claim 56 is not obvious and is allowable for the reasons discussed on pages 5-11 above.

In view of the foregoing, applicants submit that all pending claims are in condition for allowance, and a formal notification to that effect at an early date is requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 415-576-0200.

Respectfully submitted,

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